

SECTION 706 FIELD LABORATORY

706.01 DESCRIPTION.

This work consists of furnishing and placing a field laboratory as specified.

706.02 REQUIREMENTS.

The contractor shall locate the lab at a location that will allow use of lab equipment without interference from the plant operations. The building shall be under the full control and for the exclusive use of the Engineer. The building shall be located and re-located as needed as the work progresses. Each laboratory shall be supplied with an operable fire extinguisher. Outside doors shall be equipped with latches, locks, and screen doors. The field laboratory may be removed from the Project when released by the Engineer.

The building and fixtures shall remain the property of the Contractor after the work is completed.

A. Type A, Field Laboratory.

The building shall be fully insulated and watertight with a floor area of not less than 120 square feet.

The building shall be equipped with a solid workbench that has a minimum width of 24 inches, minimum total length of 10 feet, and a height of from 36 inches to 42 inches.

Windows shall be located on at least 2 sides of the building. A minimum of 2 light fixtures and 4 outlets shall be installed. Heating arrangements shall have sufficient capacity to maintain a minimum temperature of 70°. Running water shall be provided at a faucet in the building. A sink shall be provided with means of disposal for the waste water.

B. Type B, Field Laboratory.

The building shall be completely insulated, weather tight, have a minimum floor area of 230 square feet, minimum exterior width of 8 feet and a minimum ceiling height of 7 feet.

The building shall be partitioned to provide a drying room having an area of approximately 70 square feet. The room shall have 7 feet of workbench, one window, and an exhaust fan that is capable of changing the air in the room every minute.

The building shall have a minimum of 6 screened windows, and they shall be placed on 2 or more sides. Each window shall have a minimum area of 4 square feet.

A dependable source of electricity for power and lights shall be furnished. There shall be a minimum of 6 electrical outlets spaced throughout the building and 3 light fixtures spaced to uniformly light the entire interior.

A constant water supply shall be furnished with a minimum pressure of 5 psi or a minimum head of 12 feet when a gravity tank is used. A faucet and sink shall be provided in the workbench area.

The building shall be equipped with solid workbenches with a minimum width of 24 inches, length of 30 feet, and a height of from 36 inches to 42 inches. The building shall have a chair and a table or desk.

The heating system shall be capable of maintaining a minimum temperature of 70°F. The main part of the building shall be equipped with an air conditioner that can maintain a temperature below 80°F.

A microwave oven shall be provided with the following minimum requirements:

1. 30 minute timer
2. 3 position power control (full power, slo-cook, defrost)
3. 600 Watts or more of cooking power
4. One cubic foot usable oven capacity
5. Removable glass oven tray

A conventional 30-inch range shall be provided. The oven shall be a thermostatically-controlled drying oven capable of maintaining temperatures of $230^{\circ} \pm 9^{\circ}\text{F}$. ($110^{\circ} \pm 5^{\circ}\text{C}$.).

C. Type C, Field Laboratory.

Type C Field Laboratory shall meet the Standard Drawings for floor plan, and location and dimensions of each item required. All dimensions shown on the Standard Drawing shall be minimum dimensions.

The minimum floor area shall be 320 square feet. The minimum exterior width shall be 8 feet, and the minimum ceiling height shall be 7 feet.

The building shall be partitioned into 2 rooms with a connecting door and a door to the outside in each room. The sill plate of the outside door shall be no more than 3 feet above the ground.

There shall be a minimum of 6 exterior windows. The minimum total area of exterior window opening shall be 34 square feet.

The building shall be furnished with a minimum of the following built-in facilities:

1. Desk with drawers
2. Cabinets with shelves and doors

3. Work counters
4. Double sink with drain and water connection
5. Closet with shelf and clothes bar

The building shall be equipped with a constant and dependable source of electricity for power and lights 24 hours a day. Light fixtures shall be placed to adequately light all work counters and the interior of the building. Electrical outlets shall furnish the amperage rating listed on the Standard Drawings for each outlet.

The building shall be equipped with an outside water storage tank of 500 gallon minimum capacity. In addition, a 20-gallon capacity pressure tank shall be furnished and connected to the sink. The pressure tank shall draw from the storage tank and supply water to the sink at a minimum 5 psi pressure. The drain from the sink shall be connected to an outside waste line.

The building shall be fully-insulated and weather tight. A heating system shall be furnished that is capable of maintaining a minimum 70°F. in the building. An air conditioning system shall also be furnished that is capable of maintaining a temperature of below 80°F.

A microwave oven and a conventional range and oven shall be provided with the same minimum requirements as stated in Section 706.02 B.

On bituminous paving projects, the Contractor shall provide a mechanical Marshall compactor equipped with an automatic counter, three compaction pedestals, three specimen molds, three mold holders, and three compaction hammers with a 1° bevel. The compactor shall be a model H-1356, Marshall Triple Mechanical Compactor, as manufactured by Humboldt Mfg. Co. or be an approved equal. The compactor shall be capable of compacting triplicate specimens simultaneously. The Contractor also shall provide another compaction pedestal, specimen mold assembly and mold holder for calibrating the mechanical compactor. All of the equipment provided shall be furnished and set up by the Contractor and shall meet the requirements of AASHTO T-245.2.

The Department may calibrate the mechanical compactor at any time with a hand-held hammer provided by the Department. The mechanical hammer shall be adjusted if the average specific gravity of three specimens, compacted at one time with the triple mechanical compactor, is not within 0.020 of the average specific gravity of three specimens compacted with the hand-held hammer.

The Contractor may place the mechanical hammer outside or in the field lab. The Marshall hammer shall be bolted to a concrete slab a minimum of 3' × 3' × 6" in size. If the hammer is placed outside the concrete slab shall be placed level on the ground, on a sand base. If the hammer and concrete slab are placed in the lab, the Marshall area shall be shored to prevent vibration and deflection in the floor. The floor shall be supported with steel beams placed below the concrete slab. The beams shall be placed against the floor; an air space between the beams and the floor will not be allowed. The beams shall be supported with jacks placed below the Marshall area. The jacks shall be placed on a level concrete slab a minimum of 4 inches thick.

The Type C Field Laboratory shall be equipped with the following laboratory equipment:

1. Two filtering flasks, 2000 ml, heavy wall graduated.
2. A vacuum pump capable of evacuating air from filtering flask to a residual pressure of 30 mm Hg (4.0 kPa).
3. A vacuum gauge capable of measuring a minimum of 30 mm Hg (4.0 kPa) of pressure.
4. Orbital shaker with orbit size of 0.75 in (19 mm) and a stirring speed range from 40 to 400 RPM. Top plate large enough to accommodate two 2000 ml filtering flasks. Two clamps for platform to hold flasks in place. Orbital shaker equivalent to Thermolyne, Model No. M49125.
5. Electronic balance with a 5000 g. capacity capable of weighing to the nearest 0.1 g. Balance shall be equipped with a suitable suspension apparatus and holder to permit weighing of the sample in water.
6. A set of Standard Calibration Weights.
7. A thermostatically controlled water bath capable of heating or cooling to maintain a water temperature of $77^{\circ} \pm 1^{\circ}\text{F}$. with an overflow system for maintaining a uniform water level. A recirculation system with on/off controls is also required. The water bath should maintain a minimum of 5 gal (19 l) of water.
8. Insulated container for transporting mix from paver to field laboratory. Insulated container shall be large enough to accommodate 22 lbs (10 kg) of mix in pails or other type container.
9. Extrusion Jack capable of removing the plug from the marshall mold without deforming the plug.

706.03 METHOD OF MEASUREMENT.

Each laboratory will be measured as a unit complete and in place.

706.04 BASIS OF PAYMENT.

Payment will be made at the Contract Unit Price for the following:

Pay Item	Pay Unit
Field Laboratory Type ____	Each

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

SECTION 708 EROSION CONTROL

708.01 DESCRIPTION.

This work consists of furnishing and installing erosion control measures which include seeding, placing sod, mulch cover, soil retention blankets, riprap, formed fabric, concrete slope protection and other measures as specified.

708.02 SEEDING, SODDING, AND MULCHING.

A. **Description.** This work consists of laying sod, seeding, and if specified, placing a mulch cover.

B. **Materials.**

1. **Seeding.**

- a. **General.** The seed furnished shall be the species and varieties specified and shall meet or exceed Pure Live Seed requirements. Seed and seeding mixture shall be free of all prohibited noxious weed seed and shall not contain more than 1/2 of 1% by weight of restricted noxious weed seeds. Prohibited and restricted noxious weeds shall be those as classified by the North Dakota State Seed Department.

Seed which has become wet, moldy, or damaged in transit or in storage will not be accepted.

- b. **Seed Testing.** All seed shall be tested within 9 months before the planting date. The Contractor shall have the testing performed by a State Seed Lab, Commercial Seed Testing Lab, or a registered member of the Society of Commercial Seed Analysts. A certified test report shall be furnished to the Department before the seeding operation starts. Seed not planted within the 9-month period shall be retested for dormant seed, hard seed, and germination, and a new certified test report furnished.

- c. **Labeling.** Each bag of seed delivered to the Project shall bear a tag which shows the following information:

- (1) Name and address of supplier
- (2) Supplier's lot number for each kind of seed in the mixture
- (3) Origin (where grown) for each kind of seed
- (4) Purity and germination for each kind of seed